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ABSTRACT

This module consists of 4 handouts and 4 transparency masters to be used with a 35-minute tape on sex stereotyping and its effect on science and science education. The handouts are a list of women in modern science, a list of activities, an activity called the grading game in which students pretend they are teachers and list the names and grades of 4 students in each of 4 classes (English, math, science, and home economics), and a bibliography. The transparencies are: (1) a definition of stereotyping and a list of stereotypic descriptions for discussion; (2) an illustration of the scientific method; (3) a chart of the percentage of male and female workers in science-related occupations; and (4) an illustration of intellectual sex differences during childhood and adolescence. (BB)

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Project On Sex Stereotyping In Education

Equality In Science: Formula For Changing Sex Bias

Women's Educational Equity Act Program
U.S. Department of Health, Education, and Welfare
Office of Education

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Equality in Science: Formula for Changing Sex Bias

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INSTRUCTIONS

The enclosed module on sex stereotyping and its effect on science and science education is composed of a 35-minute tape, four transparency masters, three handouts, and a bibliography. The module is designed to be used independently or to supplement an existing instructional unit.

The module was developed to facilitate discussion as well as to present information. Several times during the tape, the group is requested to stop the tape recorder and participate in an activity. When the discussion of the activity appears to be winding down, the instructor or group leader should start the tape again.

The unit, with activities, should take between one and two hours. We strongly recommend that the instructor or group leader listen to the tape before using it with a class or group. We think the module is a good one, but it is only as effective as your group discussion and participation make it.

Four transparencies accompany the tape:

- Stereotyping
- The Scientific Method
- Science-related Occupations
- Intellectual Sex Differences

At the appropriate time, each transparency is introduced on the tape; following this, there is a short pause to allow the transparency to be put on the overhead projector.

Copies of the handouts should be made and distributed to members of the group prior to beginning the tape. Copies can be made by using any copying machine or by using a Thermafax machine to make ditto masters of the handoit.

Transparencies can be made by covering the enclosed transparency masters with a sheet of transparency film and running both the sheet and the master through a Thermafax machine.

This module is part of a series of instructional modules on sex-role stereotyping in education. Other modules are available in language arts, social studies, mathematics, physical education, human growth and development, and educational history.

HANDOUTS

WOMEN OF MODERN SCIENCE

The following are women who have made major contributions in the field of science. You may find this list a useful reference in your classes.

Marie Sklodowska Curie (1867-1934): Nobel prize winner in physics and chemistry for her work in radiation. Considered one of the world's foremost scientists.

Lise Meitner (1878-1968): Physicist who first suggested, in 1939, that the uranium nucleus, when bombarded with neutrons, splits in two. Theory was a key to development of the atomic bomb.

Edith Hinkley Quincy (1891-): Biophysicist instrumental in creating the science of radiation physics.

Gerty Theresa Cori (1896-1957): Nobel prize winner in 1947 for physiology and medicine. Conducted research on enzymes and carbohydrate metabolism.

Rachel Fuller Brown (1898-): Codiscoverer, with Elizabeth L. Hazen, of a valuable antibiotic.

Gladys Anderson Emerson (1903-): Biochemist effective in increasing knowledge about vitamin deficiencies in the human body.

Dorothea Rudnick (1907-): Embryologist who mastered a delicate technique for transplanting embryo sections.

Jocelyn Crane (1909-): Zoologist who studied the social behavior of a variety of animal species.

Dorothy Crowfoot Hodgkin (1910-): 1964 Nobel prize winner for discovering the molecular structure of Vitamin B-12.

Chien Shiung Wu (1912-): Nuclear physicist whose work in the physical structure of the universe had overthrown previous erroneous concepts.

Shull Russell (1913-): Zoologist-geneticist instrumental in revealing the physiological process used by genes.

Florence Van Straten (1913-): Meteorological scientist who contributed greatly to the development of the naval weather station.

Rosalynn Yalow (1921-): Nobel prize winner for medicine, 1977.

THINGS WE CAN DO

1. Examine your classroom, textbooks, and lesson plans for stereotypic attitudes, opinions, and activities.

2. Send for free publishers' guidelines on removing stereotypes in textbooks.

3. Work with your school curriculum committee to order textbooks that provide equal educational opportunity.

4. Make short biographies of women and men in science available in your classroom, and stress some of the important contributions women have made in science. You may want to use your handout or Women of Modern Science as a source of information.

5. In laboratory experiences, help your students organize so that both girls and boys are laboratory assistants and perform all the necessary tasks.

6. Invite women and men in science-related careers to your class to be role models and to talk to students about the kind of scientific preparation necessary for science occupations.

7. Work with your school counselor to see that good nonbiased vocational information about science careers is available.

8. Encourage boys and girls to participate in audio-visual clubs, science clubs, and science fairs.

9. Prepare a bulletin board featuring women scientists.

10. Propose a PTA session on sex-role stereotyping in education and its effects.

11. Initiate inservice sessions on "science education without sex discrimination."

Other ideas:

THE GRADING GAME

You are a teacher returning corrected tests to your students in four different classes. For each class, list the names of four of your students from that class and assign each of them a grade for their test.

English		Math		Science		Home Economics	
Name	Grade	Name	Grade	Name	Grade	Name	Grade

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TRANSPARENCIES

STEREOTYPING

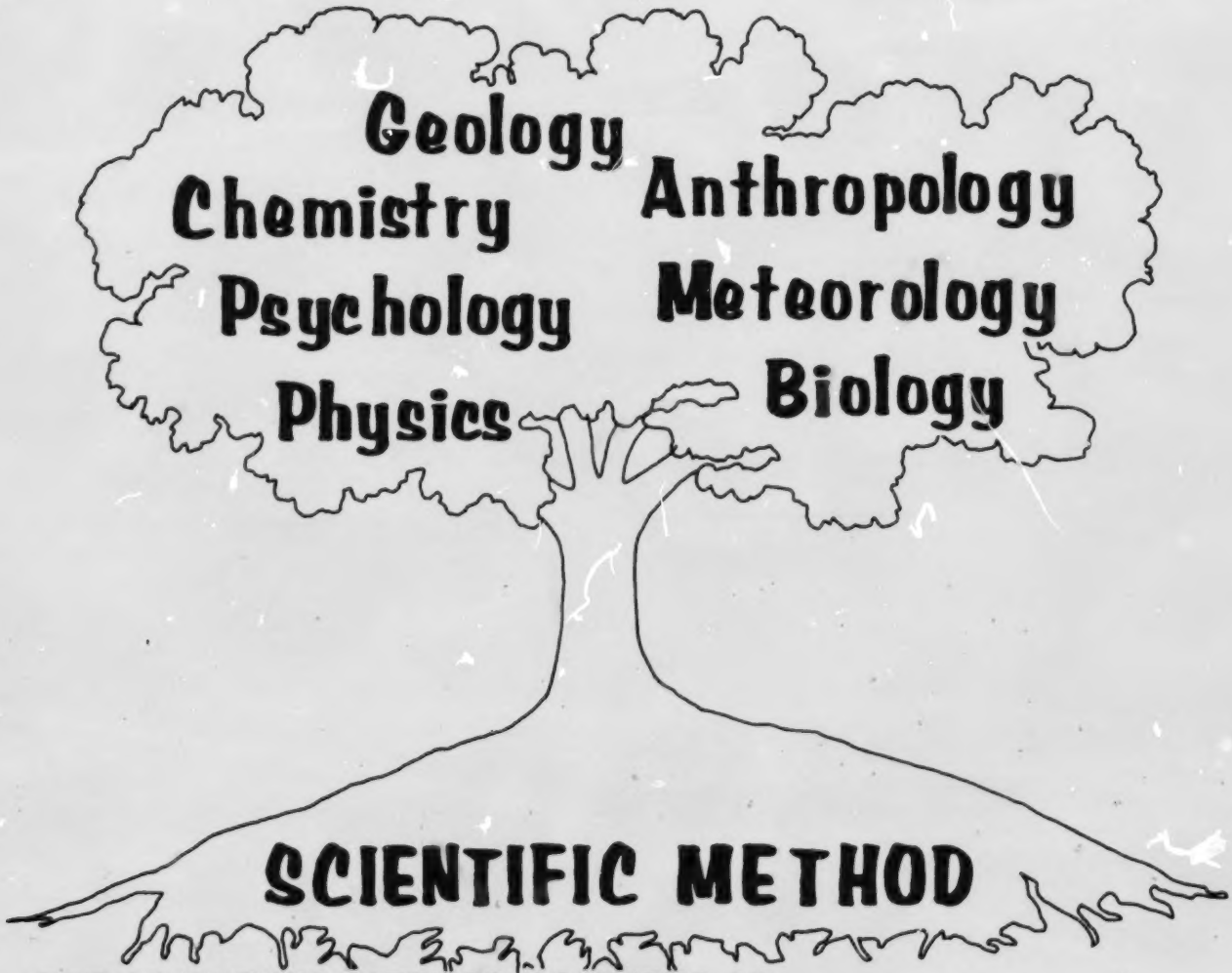
STEREOTYPING is the arbitrary assigning of certain habits, abilities, and expectations to people solely on the basis of group membership, regardless of their attributes as people.

Read the following descriptions and discuss the images and assumptions that come to mind. What would you assume or imagine about:

1. a man with tatoos on his arms?
2. a tall, young, Black man?
3. a young girl climbing trees?
4. a high school boy who writes poetry?
5. a Southern Baptist minister?
6. an Hispanic teenager?
7. a woman who failed to signal a turn while driving down the street?
8. a forty-year-old Jewish woman from New York?

Can you think of other stereotypes?

THE SCIENTIFIC METHOD



THE SCIENTIFIC METHOD CONSISTS OF:

asking clear answerable questions in order to direct one's observations, which are made in a calm and unprejudiced manner, and which are then reported as accurately as possible and in such a way as to answer the questions that were asked to begin with, after which any pertinent beliefs or assumptions that were held before the observations were made are revised in light of the observations made and the answers obtained.

Wendall Johnson, People in Quandaries (New York: Harper, 1946) p. 49.

SCIENCE-RELATED OCCUPATIONS *

	PERCENT FEMALE **	PERCENT MALE **
TOTAL WORK FORCE	40	60
Computer specialists	21	79
Engineers	1	99
Life and Physical scientists	14	86
Pharmacists	18	82
Registered nurses	97	3
Health technologists and technicians	72	18
Engineering and science technicians	12	88
Electricians	1	99

*U.S. Department of Labor Statistics, Employment and Earnings, January, 1976., Vol. 22, No. 7

**Percentages have been rounded.

INTELLECTUAL SEX DIFFERENCES

CHILDHOOD

Male Superiority

Female Superiority

General Intelligence

Verbal Measures of Creativity

ADOLESCENCE

Male Superiority

Spatial Relation Skills

Quantitative Skills

Female Superiority

Verbal Skills

Verbal Measures of Creativity

Discrimination Learning

NO SEX DIFFERENCES HAVE BEEN FOUND IN OTHER INTELLECTUAL AREAS.